Modified Neuston Net for Collecting Live Larval and Juvenile Fish

A neuston net, modified to fish from a bridge platform in a tidal current, has been used successfully at the Beaufort Laboratory for more than 2 years to catch live larval and juvenile fish for physiological and toxicological experiments. The Boothbay neuston sampler, originally used to catch larval lobsters (Sherman and Lewis 1967) and later tested as an ichthyoplankton sampler by the Marine Resources Monitoring Assessment and Prediction Program (Eldridge et al. 1977), was adapted for our purposes.

The nylon net, 2 × 1 × 8.5 m, with 0.947-mm mesh, is attached to a 5-cm OD galvanized steel pipe frame (Fig. 1). The net has a mouth-to-open-mesh aperture ratio of 1:11. However, Eldridge et al. (1977) concluded that a shorter net, 4.9 m long, with a mouth-to-open-mesh aperture ratio of 1:6 had the same catching efficiency as

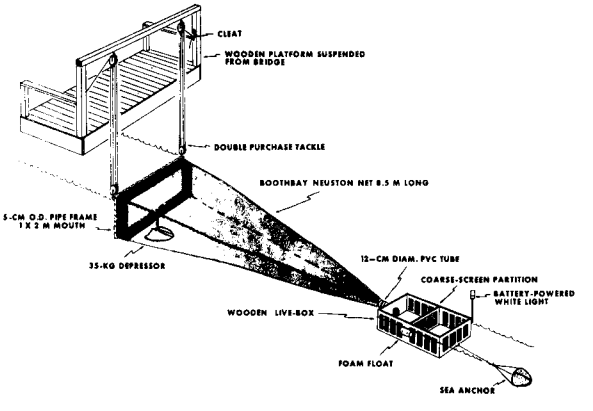

Fig. 1. Collecting system for live fish.

the 8.5-m net and was easier to handle, less expensive, and damaged specimens less. For use on the live-fish collecting system described here, the same conclusion should apply.

The cod end of the net is connected to a wooden live-box, 120 cm long, 60 cm wide, and 30 cm deep, that is screened with plastic-coated fiber glass window screen (1-mm mesh) on three sides and has a white bottom to aid in larval removal. A partition with 12-mm mesh separates the front and rear halves of the box. The partition keeps floating debris and ctenophores in the front compartment and thus offers an uncluttered rear compartment in which small fish can congregate. A small sea anchor is trailed from the rear of the live-box to keep the box and net aligned with the direction of water flow; otherwise, opposing wind can disrupt the funnel effect of the cod-end of the net by blowing the box across the flow.

The net is fished from a platform suspended under a bridge 1 m above the water surface (at high tide) of a tidal channel located 3 km landward from Beaufort Inlet. A double purchase tackle is used at each end to lower and raise the frame and net. The live-box is lowered and raised by a separate single-whip tackle. A 35-kg depressor, attached to the center of the lower frame, is used to keep the frame nearly perpendicular to the water surface. Without the depressor, water pressure causes the frame to incline, forcing the mouth of the net above the water surface, and reduces the water volume strained. As the height of the water changes during a tidal cycle, the tackles are adjusted to keep the top of the frame at the surface.

Although the net can be set and recovered from the platform by one person, two persons are needed for safety. Fishing at night is more successful; more species concentrate at the surface at this time and net avoidance is presumably lower during darkness. Fishing starts after flood tide begins and continues until the required number of specimens have been caught or until the current speed drops as the time of slack high tide approaches. Current speeds in the tidal channel when fishing is successful are about 0.3 to 0.5 m/s. Delicate species, e.g., Atlantic menhaden (*Brevoortia tyrannus*), must be dipped from the live-box with a small container, such as a 500-mL beaker, and then gently placed in larger (20-L) buckets for transport to the laboratory. Hardy species, e.g., pinfish, (*Lagodon rhomboides*), spot (*Leiostomus xanthurus*), Atlantic croaker (*Micropogon undulatus*), striped mullet (*Mugil cephalus*), and flounder (*Paralichthys* sp.), can be caught with an aquarium dip-net and placed in the transport buckets. Damage or mortality of delicate fish such as Atlantic menhaden, or *Anchoa* spp. can be reduced if fish are removed quickly from the live-box rather than allowed to accumulate for long periods.

This Boothbay neuston net modification could have other applications. For example, it could be used to catch leptocephalus stage eels for aquaculture. At times, hundreds of Anguilliformes leptocephalus larvae, including the economically valuable *Anguilla*, have been caught per hour of fishing. The collecting system could be equally useful for obtaining pelagic invertebrates for experimental purposes. On occasions extremely large numbers of live copepod adults, crab and shrimp postlarvae, and young squid have been captured.

This collector was not evaluated for net-induced mortality of captured organisms nor for its efficiency, i.e., the percentage of organisms captured relative to the absolute density of organisms in the water column. However, the gear has supplied an abundance of live larvae for experiments required for studies at the Beaufort Laboratory. Because the collector is easily set and recovered without a boat and because it has a large filter area of fine-meshed netting and does not impinge many larvae on the mesh, this gear has proved to be superior to the net previously used at the Beaufort Laboratory, described by Lewis et al. (1970).

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